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EXAMINATION OF STATISTICS AND REVIEW OF THE CURRENT MARKET SITUATION AND OUTLOOK

Recent developments and short-term outlook in the tungsten market

Report by the UNCTAD secretariat

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Chapter I

SUMMARY AND CONCLUSIONS

1. Demand conditions in the tungsten market have been greatly affected by the recent economic slowdown in the world major economies. Estimates for 1990 put world consumption of ores and concentrates at 42,809 metric tons, down by 8.1 per cent over 1989, following increases of 2.1 per cent in 1988 and 4.6 per cent in 1989.

2. The downturn in demand in addition to large imports of intermediate products have reduced seriously the consumption of ores and concentrates in major consuming countries. Consumption fell by 20.6 per cent in the developed market-economy countries and 10.1 per cent in the developing countries. In China, consumption of ores and concentrates, estimated on the basis of Chinese exports of tungsten products, began to level off following the rapid expansion of 1988-1989. Consumption in the countries of Eastern Europe was also estimated to be at lower levels compared to 1989.

3. Total world mine production was estimated at 43,830 metric tons, down by 9.6 per cent, compared to increases of 11.2 per cent in 1988 and 6.3 per cent in 1989. Production decreased by 6.5 per cent in the developed market-economy countries and by 14.1 per cent in the developing countries. Falling levels of market offtake, restrictive tariff barriers and losses in mine operations have led to a lower estimate for production of ores and concentrates in China, which was put at 25,000 metric tons compared to 28,000 metric tons in 1989. Estimates for the USSR also put recent production at lower levels compared with earlier years.

4. Estimates of world consumption and production of ores and concentrates showed a statistical surplus of supply over demand. This surplus was reflected in an increase of material held in stocks. With a saturated market and poor demand prospects, most of the material was held in producers' hands in the form of "involuntary" stocks. On the basis of available data, commercial stocks (those held by producers, consumers and dealers) rose by 9.2 per cent in 1990, further to the increase of 35.1 per cent recorded in 1989. These successive increases have led to a massive stock overhang which has exercised a strong effect on both trade and prices in the tungsten market.

5. Trade in tungsten ores and concentrates measured by export shipments fell by 33.0 per cent, compared to increases of 5.5 per cent in 1988 and 6.6 per cent in 1989. The sharp drop in the trade of ores and concentrates has been attributed not only to the downturn in demand but also to the preference of consumers to cut back their imports of ores and concentrates rather than those of intermediate products. Exports of intermediate products by China were estimated to total 11,000 metric tons, compared to 13,000 metric tons in 1989.

6. The downturn in demand, the surplus of supply over demand and the overhang of huge stocks and idle mine capacities have contributed to depressing tungsten prices in 1990. On the basis of Metal Bulletin quotations, wolframite prices averaged $US 46 per m.t.u. in 1990 compared to $US 57 per m.t.u. in 1989; scheelite prices averaged $US 63 per m.t.u. in 1990 as against $US 65 per m.t.u. in 1989. The decision of the Chinese authorities at the beginning of 1991 to exercise a stricter control on tungsten exports greatly supported the market which has recently showed some improvement. The effect of the stricter export control has, however, been undermined by the downturn in demand as well as by the large stock of material still available in the market.

7. As regards intermediate products, ammonium paratungstate was traded at an average of $US 60 per m.t.u. in the United States and $US 59 per m.t.u. in Western Europe in 1990 compared to $US 74 and $US 72 per m.t.u. respectively in 1989. The improvements in the tungsten market from the beginning of 1991 have also led to an upturn of ammonium paratungstate (APT) prices with the material trading between $US 64 and $US 65 per m.t.u. in the United States and between $US 65 and $US 68 per m.t.u. in Western Europe recently. It may be noted that price differentials between concentrates and ammonium paratungstate have further narrowed in 1990 and 1991, which has enhanced the competitive edge of the latter material.

8. As for ferro-tungsten, the market appears to have gained some control of the oversupply situation which had seriously weakened ferro-tungsten prices in 1988-1989. Ferro-tungsten prices averaged $US 5.72 per kg in 1990, compared to $US 5.29 per kg in 1989. The recent improvements in the tungsten market saw ferro-tungsten prices rise to a range of $US 6.20 to $US 6.40 per kg.

9. With respect to the short-term outlook in the market, recent forecasts do not predict that the slowdown in the major world economies will end just yet. Demand for tungsten would likely remain weak and might even further deteriorate before any upturn occurs. As regards supply, the recent initiatives taken by China to exercise stricter control over tungsten exports, if maintained until a better balance is achieved between supply and demand, would lead to a more stable tungsten market in the years to come, compared with the 1980s.

Chapter II

DEVELOPMENTS IN DEMAND AND SUPPLY IN THE TUNGSTEN MARKET

10. Demand and supply conditions in the tungsten market have been greatly influenced by the recent slowdown in major world economies. The Gulf war had both negative and positive repercussions on tungsten consumption,[1/] but appears to have affected the tungsten industry less than many earlier regional conflicts.

11. As shown in annex I, the rate of world economic growth dropped to 2.4 per cent in 1990, which was the lowest growth rate since 1984. This lower growth rate was accompanied by a serious slowdown of demand for tungsten in major tungsten-consuming industries, particularly in the capital goods sector, as capital and investment expenditures were cut back. However, the performance of the economy varied greatly from country to country. The economic slowdowns were felt particularly strongly in such countries as Canada, France, Sweden, the United Kingdom and the United States. Conversely, economic performance remained strong in Germany, Japan and the Republic of Korea. As a consequence, the effect on tungsten demand resulting from economic slowdowns has varied greatly among the major tungsten consuming countries. Economic conditions have also been less favourable for tungsten demand in the countries of Eastern Europe and in China.

12. Some early forecasts for 1991 had anticipated a further deterioration in the economic performance of several major world economies before the recent recession would bottom out. Although the developing countries, including China, are expected to achieve a higher growth rate, the economy in the rest of the world is expected to grow at a slower rate. Recent forecasts have put the world economic growth rate at 1.4 per cent, substantially lower than in 1990. Given this perspective, the outlook remains unfavourable for tungsten demand in the short term unless there is a major economic upturn.

A. Tungsten consumption

1. Consumption of ores and concentrates

13. Following the successive increases in the three years since 1986, world consumption of ores and concentrates was down in 1990, estimated at 42,809 metric tons compared to 46,590 metric tons in 1989 (annex II). The recent downturns have been explained by factors which vary from country to country. Among the various influences are the lower demand for tungsten in both domestic and export markets, increased competition from imported intermediate products, growing pressure for supply adjustments spurred by a vast imbalance in the supply/demand situation and the constraints imposed by greater trade barriers.

14. In the developed market-economy countries, consumption of tungsten ores and concentrates was estimated at 11,874 metric tons in 1990, down by 20.6 per cent, following a fall of 5.7 per cent in 1989. A major factor causing the recent decreases is the structural transformation which has affected the tungsten industry in these countries following the increasing shift of their consumption in favour of imported intermediate products. The latter materials, which are available at lower costs compared to similar domestically produced materials, have largely replaced tungsten ores and concentrates as the primary form from which tungsten is processed into higher value-added products. This shift, coupled with unfavourable demand conditions in the main tungsten-consuming industries such as the machine tool, automotive and

construction industries, had led the consumption of ores and concentrates to fall sharply in several developed market-economy countries in 1990. A large drop occurred in Germany, where consumption of concentrates decreased more than threefold, and in Sweden, where it decreased by 46.7 per cent. Other significant falls occurred in Japan (6.4 per cent) and the United States (8.7 per cent). In Austria, consumption remained at a stable level, consisting largely of domestically produced ores and concentrates. As shown below, consumption of imported tungsten intermediate products has grown substantially in all these countries in recent years.

15. Consumption of ores and concentrates of the developing countries fell by 10.1 per cent to 2,635 metric tons, compared to an increase of 14.5 per cent in 1989. The fall was largely accounted for by the sharp decrease in Brazil, resulting from deteriorating domestic industrial conditions, particularly in the steel and automotive industries. Although domestically produced ores and concentrates had been falling in the Republic of Korea, consumption of ores and concentrates remained stable through greater imports of feedstuff.

16. In Eastern Europe, consumption was estimated to have declined in recent years. Both the recent economic restructuring and the slowdown in industry have apparently seriously affected tungsten consumption in these countries. There is not yet any indication of a large-scale shift of consumption from ores and concentrates to imported intermediate products in these countries. However, as the economy of these countries becomes more market-oriented, such a shift might be expected. In the USSR, annual consumption is currently estimated at 10,000 to 11,000 metric tons but this estimate needs to be statistically confirmed. Demand is assumed to have weakened in the major consuming sectors, including the steel and mining industries.

17. With the economic reform policy, consumption of ores and concentrates has greatly increased in China to meet the needs of both domestic and export markets. Although China still remains a major exporter of concentrates, it is transforming its tungsten industry, through processing a larger quantity of its concentrates into up-market products. The larger proportion of the concentrates consumed is for downstream processing up to the stage of intermediate products, but the production of tungsten end-products such as cutting tools, drill bits and rollers is reported to be increasing.[2/]

18. On the basis of its exports of intermediate products and estimates of domestic consumption, consumption of ores and concentrates in China has more than doubled in recent years, from around 6,000 metric tons in the early 1980s to some 13,000 metric tons in 1989. Consumption for 1990 was estimated to have remained at about the latter level, but might have decreased recently following the introduction of measures to exert greater control on the export of tungsten material.

2. Consumption of intermediate products

19. With the recent structural changes in the world tungsten industry, it would perhaps be more meaningful to speak of consumption in terms of both concentrates and imported intermediate products rather than in terms of the former material alone. The effect of the change which took place principally in the developed market-economy countries varies greatly from country to country. For example, consumption of primary material currently consists only or almost exclusively of imported intermediate materials in France and the United Kingdom, and over two-thirds of imported intermediate materials in Germany, Japan and Sweden. Even in the case of Austria, where domestic mines are in operation, consumption of imported intermediate materials has recently exceeded that of ores and concentrates.

20. Annex III presents, for selected importing countries, total consumption of primary tungsten in the form of concentrates and imported intermediate products. In the seven countries listed, total consumption decreased by 17.4 per cent in 1990 compared to an increase of 45.0 per cent in 1988 and 4.2 per cent in 1989. While the recent economic downturn has affected both the consumption of ores and concentrates and the importation of intermediate products, its impact has been less pronounced on the latter than on the former. The share of intermediate products in total consumption has continued to increase at the expense of ores and concentrates.

21. In many consuming countries, the increased imports of intermediate products have resulted in the closing down of plant capacities for converting tungsten concentrates into intermediate products. In some cases, the result has been increased pressure on the authorities to adopt protective measures. Increased consumption of imported intermediate products was not, however, without benefit, particularly during the period 1987-1989. The countries which were able to take advantage of the commercial opportunity offered by the availability of intermediate materials were successful in expanding their output of up-market products and in meeting the increased demand of end-use industries without having to invest in expansion of conversion plant capacities. A higher price would have prevailed in the markets of these countries if they had had to depend on intermediate materials produced domestically from imported concentrates or on materials imported from other developed market-economy countries. Japan has been among the first consuming countries to rely on a higher proportion of imported intermediate products for its consumption.

B. Supply of ores and concentrates

1. Mine production

22. During the 1987-1989 economic upturn, there was hope that some of the mines closed down earlier might be re-opened. These hopes have now been dashed with the recent economic downturn experienced in major consuming countries and the prevailing situation of oversupply. In most producing countries, mining operations have continued to encounter difficulties arising from low profitability prospects and increasing production costs. The number of mines in operation is estimated to have fallen to less than 10 in the developed market-economy countries and to 30 in the developing countries (excluding China). The current market situation has not only raised concern about the security of future supply but has also given rise to fears that the market would be increasingly dominated by the production, distribution and pricing strategies of the larger suppliers.

23. In 1990, total mine production was estimated at 43,830 metric tons, down by 9.6 per cent following successive increases of 11.2 per cent in 1988 and 6.3 per cent in 1989 (annex IV). The main factors to which the decrease has been attributed include lower tungsten demand, weaker prices, the abundant overhang of surplus materials and poor market prospects. The effect of these factors on production varies greatly however, from country to country.

24. With a large number of mine operations either completely shut down or operating at greatly reduced capacities, developed market-economy countries currently account for only 11 per cent of world mine production, against over 25 per cent at the beginning of the 1980s. In 1990, their total mine production amounted to 5,000 metric tons, down by 6.5 per cent over the previous year, compared with increases of 19.9 and 3.1 per cent in 1988 and 1989, respectively. Production rose mainly in Portugal (2.0 per cent) and

Sweden (8.2 per cent), and fell mainly in Australia (19.6 per cent), Japan (11.2 per cent) and the United States (11.1 per cent). Both Japan and Sweden produced only small tonnages of concentrates. With few large tungsten mines left, Australia, Austria and Portugal together accounted for 80 per cent of the production of this group. It may further be noted that a large proportion of the production, as for example in Australia and Portugal, originated from bimetallic or multimetallic mines which were less affected by the price conditions prevailing in the tungsten market.

25. Mine production has also been reduced sharply in the developing countries. In 1990, their production amounted to 4,780 metric tons, down by 14.1 per cent, further to the decrease of 4.8 per cent in 1989. Production decreased in Brazil (46.8 per cent), the Republic of Korea (19.9 per cent), Myanmar (3.0 per cent) and Thailand (55.2 per cent); while it rose in Bolivia (7.3 per cent) and Mexico (7.6 per cent). Except Bolivia and the Republic of Korea, which together account for over half the production of this group, each of the other countries produced only small tonnages. Further, a substantial part of the production of this group is derived from bimetallic ores, for example in Bolivia, the Republic of Korea, Mexico, Peru and Thailand.

26. Mine production in China has been estimated to stand at 25,000 metric tons. In the second half of the 1980s, Chinese mine production increased rapidly to reach the present annual level of 25,000 to 30,000 metric tons, compared with 16,000 to 18,000 metric tons earlier in the decade. This increase was accompanied by a fast expansion of plant capacities for processing, oriented mainly towards the export market. More recently there have been some production cutbacks prompted by the need to adjust to changing market conditions. Further cutbacks are expected following the decision taken by the Chinese authorities to impose stricter control over the marketing and exports of tungsten materials.

27. Mine production in Eastern Europe was put at 7,050 metric tons after recent estimates sharply scaled down expected production in the USSR. Annual mine production in the USSR was estimated to have remained at around 7,000 metric tons of ores and concentrates, compared to 9,000 to 10,000 metric tons during the early 1980s up to 1987. The fall in output has been attributed to certain difficulties facing the tungsten industry. Besides the slowdown in major consuming industries, such as oil drilling, mining, metallurgy and defence, mine production has also been affected by declining ore grades, increased investment costs and low productivity. The recent market reform policies seem to have also affected production, particularly in small mines, and has recently led to rising doubts about the survival of many of these mines.[3/]

2. Stock movements

28. With the recent surplus of production over consumption, there has been an increase of materials held in stock. According to available data, the stock of ores and concentrates held by producers, consumers and dealers (commercial stocks) rose by 9.2 per cent to reach 6,305 metric tons in 1990, on top of the increase of 35.1 per cent in 1989. These successive increases have built up the level of materials in stock to a level comparable to that reached in 1986, when the overhang pressure exerted by excessive stocks contributed to a price collapse.

29. Deteriorating economic conditions and lower market offtake had led to an increase of material accumulated in stock by producers in 1989 and 1990. Producers' stocks of ores and concentrates rose by 20.5 per cent and 9.9 per

cent in 1989 and 1990, respectively, to reach 4,217 metric tons. The largest producers' stocks were held by Australia, Portugal and Thailand.

30. The growing displacement of concentrates by imported intermediate products noted earlier has affected the level of consumers' stocks of ores and concentrates in many consuming countries. Thus, for example, negligible volumes of concentrates are held in stock in Canada, France and Sweden, where consumption has shifted mainly to imported intermediate products. Only Japan and the United States still report relatively substantial quantities of material in consumers' stocks. In 1990, consumers' stocks rose by 53.3 per cent in the former country but fell by 14.6 per cent in the latter.

31. There is a great lack of transparency about dealers' stocks, partly owing to the fact that dealers are reluctant to reveal the size of the stocks which they have built up. Only two countries had reported dealers' stocks in 1990. The tonnages reported showed a decrease in Thailand from 107 to 83 metric tons but an increase in Peru from 7 to 27 metric tons.

32. The only figures available on stocks of intermediate products are those published by the United States Bureau of Mines. The end-of-year total of producers' and consumers' stocks of ammonium paratungstate in that country amounted to 896 metric tons in 1990 compared to 915 metric tons in 1989 and 911 metric tons in 1988.

33. There has been little movement reported as regards the United States stockpile. No further sales have taken place since the completion of the sales programme in 1989 (annex VI). As last reported, the total defence inventory of tungsten ore and concentrates stood at 34,634 metric tons.

C. Developments in mine capacity

34. The tungsten mining industry is currently characterized by a low rate of capacity utilization. On the basis of figures published by the United States Bureau of Mines, the countries with the lowest rate of capacity utilization included Canada and the United States. There was also a substantially low capacity utilization in Australia and the Republic of Korea. The situation appears to have further deteriorated in the latter two countries as production has recently suffered further cutbacks. At the current price level, few of the mine operations that had been closed were likely to re-open in the near future.

35. Annex VII presents an updated list of new mining projects. These projects are at various stages of consideration. The most recent to have been added to the list are the La Parrilla project in Almomarin (Spain) and the Almora project in Uttar Pradesh (India). In the latter case, India has been interested in expanding domestic production of tungsten concentrates with a view to achieving a greater integration of its tungsten industry. In the case of Spain, production of ores and concentrates has been recently declining. If the La Parrilla project goes ahead, it would contribute to boost domestic production. However, with poor market prospects, low tungsten prices, and the high level of overcapacity, few of the projects shown on the list are likely to come on stream soon.

Chapter III

DEVELOPMENTS IN TUNGSTEN TRADE

A. Developments in trade policy

36. The dominant development affecting tungsten trade recently has no doubt been the decision taken by China to impose stricter control over the marketing and exports of tungsten materials. This decision is part of a national mineral policy announced by the Chinese Government at the beginning of the year for strengthening the protection of national mineral endowments, including tungsten, tin, titanium and ironic rare earths.[4/] The policy covers many aspects including mining, refining, processing, marketing and exporting, with regard to these minerals.

37. Several points of interest may be noted concerning tungsten trade. Existing dispositions against illegal mining and smuggling, which remain banned, have been strengthened. In order to enforce orderly mining, mining permits are to be issued by China National Non-ferrous Metals Industry Corporation and China's State Council Rare Earths Unit. All previous mining permits issued by local authorities were forthwith cancelled. Perhaps more important to international trade is that the new policy on tungsten exports by China, as well as exports of the other minerals, has centralized control with the Ministry of External Relations and Trade responsible for the issue of export licenses for imposing export limits. Exports beyond these limits are completely banned and deemed illegal; any unlicensed exports are to be dealt with severely.

38. Another major policy development to be noted with respect to international trade is the changing trading arrangements among the socialist countries. Trade among these countries has been conducted mainly through protocol trade. As these countries move towards a more market-oriented system, protocol trade is being reduced. The impact of this change on tungsten trade is likely to be stronger in the future, particularly in the countries of Eastern Europe, which account for an estimated 30 per cent of world consumption and 32 per cent of world imports of tungsten. To the extent that sales against hard currencies are replacing transactions through protocol trade, developments in this respect are expected to affect both the volume, and the direction and composition of tungsten trade.

39. Another development which is expected also to affect both the pattern of trade and market stability is the way by which the trade between China and the United States is to be conducted when of the Orderly Marketing Agreement (OMA) lapses in September 1991. The Agreement signed by the two countries in 1987 covered a period of four years. It has operated principally on the basis of quotas, which put a ceiling on import shipments of Chinese ammonium paratungstate and tungsten oxide into the United States. At the time of writing, no indication has been given of whether the agreement will be renewed or re-negotiated, a situation which adds uncertainty in the market. Meanwhile, there has been signs of increasing protectionist pressure to limit the imports of Chinese materials. This pressure has included efforts to introduce quotas to cover a more comprehensive number of tungsten products as well as anti-dumping duties. As regards the latter, the United States Department of Commerce has recently made a preliminary determination that China is dumping tungsten ores on the United States market.[5/] A final determination is still awaited.[6/]

40. Faced with similar protectionist pressure, the Commission of the European Community had adopted a number of anti-dumping duties in April 1990, with a view to curbing the imports of several tungsten materials.[7/] The duties which were provisional were further extended after the lapse of the preliminary period. Meanwhile, an agreement was reached between China and the EEC countries with a view to limiting the repercussions on imports as well as introducing a system of controls which would take into account supply conditions in the EEC market.[8/] The two parties have undertaken to meet at quarterly intervals so as to examine import volumes and prices, and verify compliance with the clauses of the agreement. There is no indication as yet whether the recent price improvements and supply cutbacks have met the conditions for allowing the duties to lapse.

B. Trade in ores and concentrates

41. Trade in ores and concentrates, which faced severe cutbacks in the past years as a result of the availability of competitive intermediate material, has suffered further setbacks more recently. These setbacks were attributed partly to the economic slowdown and partly to the export control implemented by China. Among the first steps taken by China following the recent policy announcement was the complete suspension of exports of ores and concentrates.[9/] The successive decreases in the volume of trade of ores and concentrates have greatly reduced the status of this material as the form in which most tungsten is traded internationally. A large part of the international trade in tungsten currently takes the form of ammonium paratungstate, tungsten oxide, tungstic acid, sodium tungstate, etc, instead of ores and concentrates.

42. In 1990, total world imports of ores and concentrates were estimated to be 17,983 metric tons, compared to 21,664 metric tons in 1988 and 22,128 metric tons in 1989 (annex VIII). The largest cutbacks in imports of ores and concentrates occurred in Germany, which shifted to imported intermediate products in the face of increasing competitive pressure rather than continue to depend on imported ores for domestic conversion into intermediate products. The only remaining large importers of ores and concentrates are Japan and the United States, both of which have a large domestic market. In 1990, while imports of ores and concentrates rose by 12.5 per cent in Japan, they fell by 18.0 per cent in the United States. Imports of ores and concentrates are estimated to have recently experienced a significant decline in the USSR.

43. As a result of the economic slowdown and structural change, export shipments of ores and concentrates showed a substantial drop (33 per cent) in 1990. Total world exports were estimated at 17,293 metric tons compared to 25,811 metric tons in 1989 and 24,210 metric tons in 1988. The export cutbacks occurred mainly in China which had been reducing its exports of ores and concentrates even before the introduction of its stricter policy on export control. Exports from China decreased sharply by 46.8 per cent to 8,465 metric tons. This tonnage is the lowest since 1982, when the export market was severely affected by the recession of 1982-83.

44. Export shipments from sources other than China have remained relatively stable, following the large-scale mine closures in past years, particularly between 1986 and 1987. Excluding Hong Kong,[10/] total exports from these sources have stood at about 8,000 metric tons in 1989 and 1990 compared with some 16,000 metric tons in 1985. In past years, exports from a number of countries had ceased including Brazil, Canada and the Republic of Korea, and had declined substantially from a number of other countries, including Australia, Peru and Thailand. A major exception is Portugal, which appears to

have been successful in maintaining its level of exports despite the prevailing market conditions. In 1990, total Portugese exports showed major improvements rising by 13.8 per cent to 1,319 metric tons. There was also a substantial improvement in Bolivia, but its exports, estimated at 1,110 metric tons in 1990, were less than half the level of the early 1980s.

45. In the meantime, the total export value of ores and concentrates dropped substantially as a result of the declines in both the volume of trade and the price of tungsten. The total value of world exports of ores and concentrates was estimated at $US 104 million in 1990, compared with $US 172 million in 1989. In comparison with the early 1980s, the total export value of tungsten ores and concentrates has sunk by more than two thirds.

C. Trade in intermediate products

46. While trade in ores and concentrates has been declining, that in intermediate materials has assumed a greater importance mainly as a result of the expansion of processing capacities in tungsten-producing countries, particularly China and the Republic of Korea. With the shift to imports of intermediate materials for satisfying tungsten requirements in the consuming countries, shipments of intermediate materials are fast eclipsing those of ores and concentrates in these countries, including in particular France, Germany, Japan, United Kingdom and United States. This structural change in tungsten trade has led to the closing down of domestic plant capacities for converting ores and concentrates into intermediate products in consuming countries. As the share of intermediate materials in overall tungsten trade is likely to increase, some tungsten-producing countries, which have remained essentially exporters of ores and concentrates, have had to face the choice of either competing more intensively to find market outlets for their ores and concentrates, or embarking upon the processing of their ores and concentrates into downstream products.

47. In 1990, total export shipments of intermediate materials, including ammonium paratungstate, tungsten oxides and hydroxides, sodium tungstate and ferro-tungsten were estimated at 19,000 metric tons (gross weight) compared to 21,000 metric tons in 1989,[11/] representing a decrease of 9.5 per cent. Thus, exports of intermediate materials were also affected by the economic slowdown, but to a lesser extent than exports of concentrates, which fell by 33 per cent, as mentioned earlier.

48. The main sources for such materials as ammonium paratungstate, tungsten oxides, hydroxides and ferro-tungsten include China and the Republic of Korea. Total Chinese exports of ammonium paratungstate, tungsten oxides, tungsten acid, sodium tungstate and ferro-tungsten were estimated to amount to about 11,000 metric tons in 1990 compared to 13,000 metric tons in 1989 and 8,000 metric tons in 1988. The economic slowdown in major consuming countries, lower tungsten prices and the threat of protectionist measures or retaliation in major consuming areas would suggest greater restraints on exports by China in 1991.

49. At present, the Republic of Korea exports all its tungsten in the form of higher value-added products. In 1990, its total exports by gross weight fell by 16 per cent to 1,405 metric tons. It may be noted that the Republic of Korea has recently reduced its exports of tungstates (principally APT) which amounted to 476 metric tons in 1990 compared to 1,311 metric tons in 1987. Meanwhile, exports of tungsten carbide have increased from 499 metric tons to 700 metric tons over the same period.

50. Following three successive years of expansion since 1987, world imports of intermediate materials decreased in 1990. According to available data covering Japan, the United States and Western Europe, imports fell in 1990 by 22.0 per cent for ammonium paratungstate, by 2.6 per cent for ferro-tungsten and by 28.0 per cent for tungsten oxides and hydroxides. However, the effect of the economic slowdown on imports of intermediate products has varied from country to country. Thus, APT imports fell mainly in France (8.9 per cent), Japan (11.7 per cent), Sweden (53.0 per cent), the United Kingdom (45.0 per cent) and the United States (30.0 per cent), but rose in Austria (59.0 per cent) and Germany (83.0 per cent). As for ferro-tungsten, imports fell in Austria (10.0 per cent), France (44.2 per cent), and Sweden (18.0 per cent), but rose in Germany (5.0 per cent), Japan (12.4 per cent), and the United States (35.4 per cent). In terms of tonnages, the largest importers of intermediate products were Japan (4177 metric tons), Austria (2850 metric tons) and Germany (2394 metric tons).

Chapter IV

RECENT PRICE DEVELOPMENTS IN THE TUNGSTEN MARKET

51. As the world experienced economic recession after the growth of 1988-1989, it was feared that tungsten prices, which were already at a historically low level, would further decline in the face of abundant supplies and the slowdown of demand in the major consuming industries. These fears have proved to be unfounded. Instead, the tungsten market surprisingly made some price gains, in comparison with many other mineral and metal markets where prices have generally been depressed (see figure). While the average mineral and metal price has continued to slide, the price of tungsten has been relatively stable.

52. However, the recent price gains made by tungsten were both partial and limited. They were partial because they benefitted mainly wolframite, and limited because the level of tungsten prices was still low in comparison with the beginning of the 1980s. Since 1982, the tungsten market has been weak, with tungsten suffering some of the sharpest price falls among minerals and metals, with a trough occurring in 1986. The effect of these setbacks is still by and large felt by the tungsten industry. Nonetheless, the recent price upturn has been a welcome market development, particularly for those who were threatened by plant closure if tungsten prices weakened further. It remains to be seen whether the recent price improvement gains ground and affects in a substantial way not only wolframite but also intermediate tungsten materials.

A. Prices of tungsten ores and concentrates

53. The prices of wolframite, which were already negatively affected by oversupply in 1989, eroded further in 1990 as demand conditions deteriorated. Wolframite prices were quoted at between $US 41 and 60 per m.t.u. in January 1990, compared to an average range of $US 44 to 60 per m.t.u. in the last quarter of 1989. With stocks at a high level and an increased imbalance between supply and demand owing to lower levels of market offtake, concentrate prices suffered further setbacks during the rest of 1990. Wolframite prices ended the year in a range between $US 37 and $US 49 per m.t.u., a level which was seen only during the price collapse of 1985-1986. The downward price pressure was felt most seriously by low-grade materials, and this considerably widened the price differentials between the higher- and lower-grade wolframite.

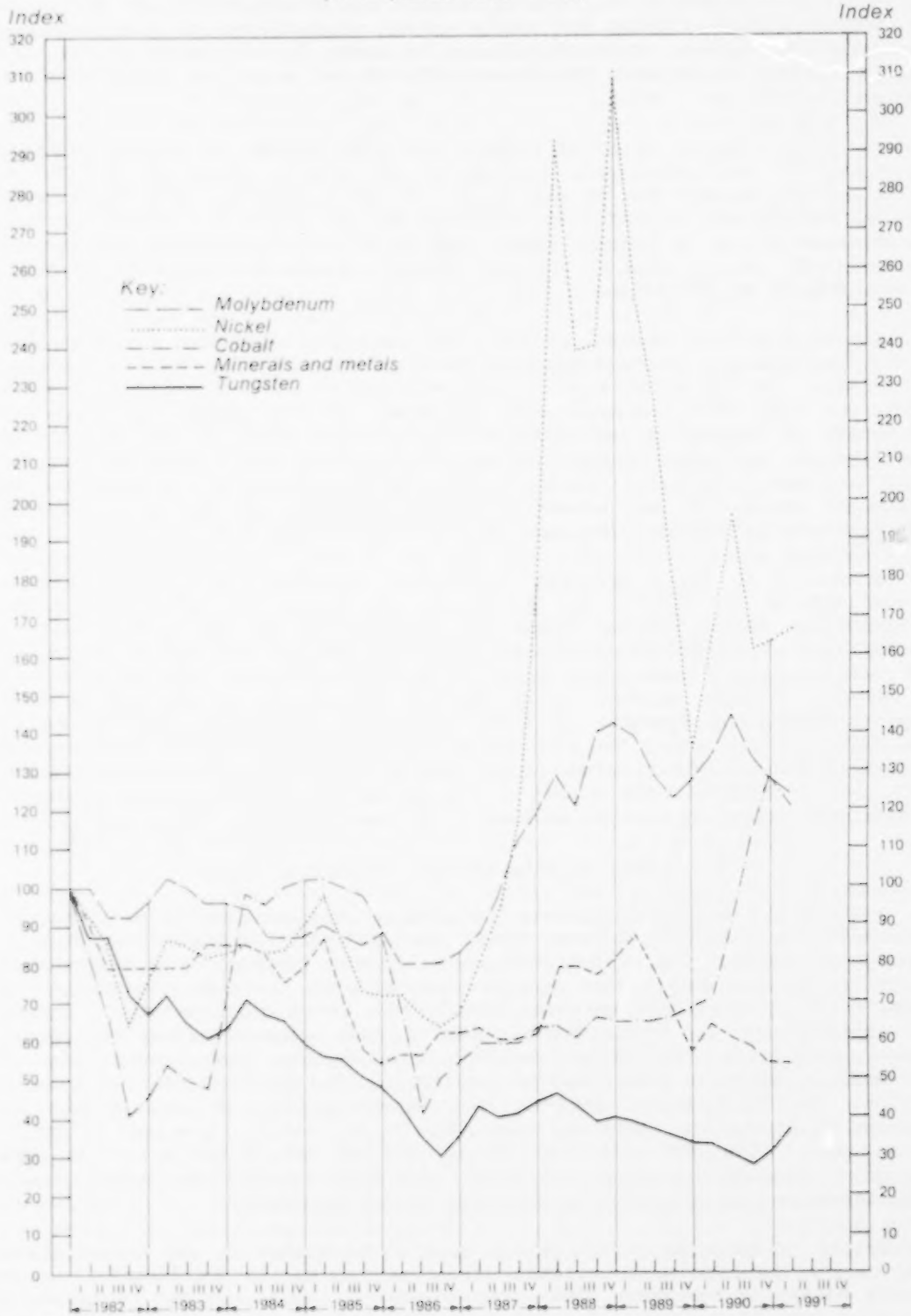
54. Considering China's size as an exporter of ores and concentrates, its announcement in early January 1991 to suspend exports of ores and concentrates had an immediate impact on the tungsten market. However, the relatively larger reserve of stock materials, the more ready availability of intermediate products and the low market offtake have muted the expected effect. At the time of writing, it was still not known how long the ban would last.12/

55. Following the announcement by China, wolframite prices were underpinned from further slides and grew firmer. The market entered 1991 with wolframite being quoted in a range between $US 39 and $US 49 per m.t.u. Despite a low market offtake, the concentrate market began to show some strength with prices rising steadily to reach between $US 45 and $US 51 per m.t.u. by the end of the first quarter. Meanwhile the price differentials between the lower- and higher-grade wolframite narrowed sharply, mainly as a result of the decreased availability of low-quality materials. In the past years, the abundant supply of such materials had led to a serious imbalance between supply and demand, contributing to depressed prices in the whole of the tungsten market.

Figure

COMPARISON BETWEEN TUNGSTEN AND SELECTED MINERAL AND METAL PRICES

(First quarter 1982 = 100)



Source: UNCTAD secretariat and *Metal Bulletin*

56. At the time of the Canton Fair, Chinese suppliers continued to apply the ban on exports which resulted in few contracts being concluded.13/ Wolframite prices held firm, ranging between $US 50 and $US 57 per m.t.u. In the second quarter, there was some revival of business as some consumers re-entered the market, which contributed to drive up wolframite prices, with parcels trading at between $US 54 and $US 60 per m.t.u. at the end of the quarter.

57. For the first half of 1991, on the basis of Metal Bulletin quotations,14/ wolframite was trading at an average price of $US 51 per m.t.u., compared with $US 46 per m.t.u. in 1990. However, the improvements were not sufficient to bring the six-month average price of tungsten ores and concentrates up to the average level ($US 56-57) attained during the recovery of 1988-1989. At the time of writing, however, wolframite was being traded at between $US 56 and $US 60 per m.t.u.

58. In the scheelite market, prices also remained stable, partly underpinned by the improvements in the wolframite market. As a whole, scheelite suffered a much more limited price erosion than wolframite under the depressed market conditions of 1990. Despite the slowdown in the steel industry, the oversupply of competing materials and the lower level of market offtake, scheelite has not experienced the same degree of price fluctuations as some other tungsten materials. The prevailing market situation for scheelite was attributed mainly to the greater market discipline of the main scheelite suppliers and the quality premiums commanded by the material.

59. According to Metal Bulletin quotations, scheelite was being traded at between $US 56 and $US 72 per m.t.u. as the market entered 1990. With a continued low market offtake, scheelite was on offer at lower prices although the decreases in scheelite prices were far less than in wolframite prices. At mid-year the material was being traded in a range of between $US 54 and $US 72 per m.t.u., falling to $US 52 and $US 71 per m.t.u. by the end of 1990. Notwithstanding the economic slowdown, the price range has remained at the same level in 1991 up to the time of writing. With the recent gains made by wolframite prices, the premiums which existed between the two materials have been greatly reduced. In fact, it is currently wolframite that enjoys a premium over scheelite, as far as lower-grade materials are concerned.

B. Prices of intermediate tungsten products

60. Without the supply adjustments prompted by depressed market conditions or that resulting from the Chinese export ban, prices of intermediate products would have remained low or declined even further. However, the improvements in the concentrate market have provided some prop-up, at least contributing to underpin the intermediate markets from further price deterioration. Because the improvements in intermediate products have lagged behind concentrate prices, the price differences between tungsten ores and concentrates and intermediate products have further narrowed. In 1991, up to the time of writing, the differential between the average prices of concentrates and ammonium paratungstate (APT) was about $US 11 per m.t.u., compared to $US 13 per m.t.u. in 1990, $US 15 per m.t.u. in 1989 and $US 17 per m.t.u. in 1988. The price developments of recent years have made intermediate products more competitive as a material for producing up-market products.

61. Prices of ammonium paratungstate used to be higher in the United States than in the European market. This situation was partly attributable to the Orderly Marketing Agreement (OMA), implemented in 1987, and due to expire in September 1991 if not renewed. Recently, the differential between APT prices of the United States and Europe had narrowed considerably. In the United

States, ammonium paratungstate was trading between $US 60.50 and $US 61.50 per s.t.u. ($US 66.70 and $US 67.80 per m.t.u.) as the market entered 1990. There were some limited improvements towards the second quarter of the year when prices were quoted at between $US 61.00 and $US 61.50 per s.t.u. ($US 67.20 and $US 67.80 per m.t.u.). However, the improvements were not sustainable in the face of an increased imbalance between supply and demand in the tungsten market and the virtual collapse of concentrate prices. The APT market ended the year with the material being offered within a price range of $US 58.00 and $US 59.50 per s.t.u. ($US 63.90 and $US 65.60 per m.t.u.).

62. As noted earlier, there was a turnaround in 1991 which accompanied the improvements in the prices of ores and concentrates. At the time of writing, ammonium paratungstate was trading at a range of $US 64.00 to $US 65.00 per s.t.u. ($US 70.50 and $US 71.60 per m.t.u.) in the United States. Some uncertainty surrounds future price trends as nobody is quite sure what will happen when the Orderly Marketing Agreement (OMA) between China and the United States lapses. Whether the agreement will be renewed and if so under what terms and conditions are questions with far-reaching ramifications.

63. APT imports still enjoy relatively free access to markets in Western Europe. It may be noted that the anti-dumping duties imposed by the EEC on Chinese tungsten materials in 1990 did not include ammonium paratungstate. The existing import conditions have allowed Western Europe to import Chinese ammonium paratungstate at relatively lower costs compared to the United States, which puts European powder producers at a competitively advantageous position because of the lower price paid for their feedstuff to produce powder products.

64. In Western Europe, the material was quoted at between $US 59.75 and $US 61.00 per m.t.u. at the beginning of 1990. Improvements in the tungsten market during the second quarter of 1990 saw APT prices rise to between $US 61.50 and $US 63.50 per m.t.u. However, the economic slowdown and the low level of business weakened APT prices which were being quoted within a range of $US 56.50 and $US 58.00 per m.t.u. by the end of the year. With the recent upturn in the tungsten market, APT prices rose steadily in 1991 and the material was being traded at between $US 65.00 and $US 68.00 per m.t.u. at the time of writing. Despite recent increases ammonium paratungstate is still a relatively cheap material compared to both wolframite and scheelite.

65. Among intermediate materials, ferro-tungsten is perhaps the product most seriously affected by oversupply. The situation was such in the ferro-tungsten market that despite the favourable demand conditions in 1988-1989, ferro-tungsten prices continued to decline during the period. Apparently the market has recently gained better control over supply excesses. In 1990, the price of ferro-tungsten, which started the year within a range of $US 5.15 - 5.25 per kg, reached $US 5.95 - 6.20 per kg by the end of the year. The average price for the year was $US 5.72 per kg compared to $US 5.64 and 5.29 per kg in 1988 and 1989, respectively. In 1991, prices have remained on average consistently above $US 6.00 per kg.

66. The recent increases in the prices of concentrates and intermediate materials have not led so far to an increase in suppliers' prices of tungsten powder and tungsten carbide powder. This situation may be explained partly by the depressed demand conditions which still prevail in the market and partly by increased competition, with the entry of new suppliers into the market. Since December 1990, tungsten powder and tungsten carbide powder of one-micron grade were being reported to be available at £ 9.25 and £9.75 per kg, respectively. Since the appreciation of the United States dollar, the prices of tungsten powder and tungsten carbide powder quoted in pounds sterling are now lower when expressed in United States dollars.

Chapter V

THE SHORT-TERM OUTLOOK IN THE TUNGSTEN MARKET

67. Recent developments in the tungsten market point to a situation which continues to be plagued by oversupply. The action recently taken by China to strongly curb its tungsten exports has resulted in a more stable market situation, thus averting a serious collapse of the tungsten market which had been feared following the recent economic slowdown in major consuming countries. However, as the foregoing analysis has indicated, the tungsten market still remains weak, characterised by a low market offtake, an abundant supply of tungsten materials, a large overhang of stock in the market, as well as continued shutdowns of mine capacities and a greater threat of protectionist measures. Despite some recent improvements, tungsten prices are still relatively low, well below half the price prevailing at the beginning of the 1980s.

68. Under the present market situation, the outlook from the demand side does not provide much room for optimism concerning any substantial strengthening of the market, at least in the short-term. Major consuming industries such as automotive manufacturing, residential and non-residential construction, metallurgy and mining have been seriously affected by the recent slowdown. Most recent short term forecasts predict a further economic slowdown in the major consuming countries. In these circumstances, tungsten demand faces the prospect of a weak market at least in the shorter-term which possibly further deterioration before there is an improvement.

69. In contrast to the short-term bearish situation, the longer term shows prospects for stronger demand in the tungsten market. Recent forecasts, including those made by the World Bank, indicate an improved performance of the world economy in the 1990s. Meanwhile, the effects of substitution and technological changes are also expected to favour to tungsten consumption, given the relatively low level of tungsten prices. In the areas of substitution, which are largely price-determined, there would be stronger incentives to use more tungsten. Likewise, tungsten may benefit from its present relatively low price levels to find new industrial applications.

70. On the supply side, the market has recently been overflowing, with a plentiful supply of tungsten materials including both concentrates and intermediate products. Shipments have been substantially curtailed recently by measures adopted by China. Nevertheless, the economic slowdown and the large stock overhang have greatly muted the effect of these export cutbacks. It is expected that once stocks are further depleted, a stronger market would emerge.

71. The longer-term outlook in the tungsten market would greatly depend not only on how long the cutbacks are maintained but also on whether such cutbacks are to be applied more comprehensively so as to achieve a better balance between supply and demand. There is a possibility that the measures will be relaxed. If this were to happen, the market prospects would change. A return to large export shipments without a demand upturn would lead to a market relapse with weaker prices. Conversely, if the measures are sustained long enough to restore the balance between supply and demand, there are good prospects for improved price conditions during the decade compared with the 1980s.

72. Meanwhile, the structural change which has recently entailed increased imports of intermediate products as feedstuff is likely to become more pronounced. This development would mean that producing countries which continue to rely on exports of their tungsten in the form of concentrates would find themselves at a disadvantage because of the dwindling size of the market outlet for ores and concentrates. They are likely to benefit less from any improvement in the tungsten market. Prospects therefore exist in the tungsten industry for greater diversification into processing in the producing countries which would enable them to upgrade their concentrates into processed products. Such diversification would not only help maintain existing mines in operation but might also result, at the next demand upturn or even earlier, in the re-opening of capacities currently closed down.

Notes

1/ A study presented by A.P. Newey, shows that peaks in demand for tungsten have been historically associated with military activity (See A.P. Newey, Primary Tungsten Supply and Demand: The Short-term Outlook, proceedings of the Third International Tungsten Symposium Madrid, May 1985, pp 19-33).

2/ Financial Times, 3 November 1989, page 7, and China Tungsten Industry News, April 1991, pages 2-3.

3/ For further details on the tungsten industry in the USSR, refer to Mr. Marchenko's presentation at the twenty-second session of the Committee on Tungsten (TD/B/C.1/TUNGSTEN/23).

4/ The announcement made by the State Council of China was reported in several national papers, including China Nonferrous Metals News, volume CNII-0115, issue 404, 21 February 1991, page 1.

5/ Refer to Daily Bulletin, issued by the United States Mission in Geneva, Number 124, dated 5 July 1991.

6/ If the final determination is positive, antidumping duties would be collected on imports to offset the unfair advantage. With an anti-dumping margin estimated at 151 per cent, the price of ores and concentrates would be raised to $US 135-$US 150 per m.t.u. for wolframite on the basis of Metal Bulletin quotations. Tungsten concentrates have not been at such levels since the late 1970s, a period when industry was driven by high tungsten prices to find substitutes.

7/ The duties consisted of 33 per cent on tungsten carbide powder, 35 per cent on tungstic acid/oxide, 37 per cent on tungsten ore supplied by CNIEC (China National Non-Ferrous Metal Import and Export Corp.) and 42.4 per cent on ore from other suppliers, including Minmetals. On the basis of MB price quotations, the anti-dumping duties would raise the price of Chinese concentrates to $US 75-82 per m.t.u. if originating from CNIEC and $US 78-85 per m.t.u. if originating from other Chinese sources.

8/ Refer to Report of the Committee on Tungsten on its twenty-second session, TD/B/C.1/TUNGSTEN/87, paragraph 46.

9/ Report in International Commercial Newspaper, volume 6, issue 788, January 15, 1991, page 1.

10/ As it does not produce any tungsten concentrates, exports from Hong Kong consist entirely of re-export.

11/ Estimates based on information available from China, France, Germany, Japan, Republic of Korea, Spain, United Kingdom and United States.

12/ China Tungsten Industry News reported that the ban was temporary but did not indicate when it would be lifted (See China Tungsten Industry News, Number 8, January 1991, page 1).

13/ Refer to report "Chinese stay firm at Canton Fair" in Metal Bulletin, 22 April 1991, page 1.

14/ There have been a number of changes in the information usually used by the secretariat for the price analysis in the market review. The International Tungsten Indicator (ITI) has ceased to appear from December 1990; and the Metal Bulletin no longer publishes the tonnages on the basis of which its quotations are based. The main reference for tungsten powder prices is derived from Metal Powder Report (the monthly journal for the powder metallurgy industry).

Annex I

Economic growth rates and forecasts in selected countries, 1982-1991 a/

Country/region	1982	1983	1984	1985	1986	1987	1988	1989	1990	Forecast 1991
World economy	0.4	2.1	4.2	3.5	3.0	3.5	4.3	3.3	2.4	1.4
Developed market-economy countries	-0.2	2.4	4.5	3.4	2.7	3.4	4.2	3.5	2.4	1.4
Canada	-3.2	3.2	6.3	4.8	3.3	4.0	4.4	3.0	0.8	0.1
France	1.8	0.7	1.6	1.9	2.2	1.9	3.4	3.4	2.8	1.5
Germany b/	-1.0	1.5	3.0	2.0	2.4	1.7	3.6	4.3	4.5	2.8
Italy	0.3	1.1	3.0	2.6	2.5	3.0	4.1	3.2	2.2	1.3
Japan	3.1	3.2	5.1	4.6	2.5	4.2	5.7	4.8	5.6	3.8
Sweden	0.8	2.5	3.0	2.5	1.7	2.8	2.5	2.1	0.9	-0.9
United Kingdom	1.5	3.5	2.9	3.7	3.5	4.7	4.2	2.3	0.6	-1.8
United States	-2.5	3.5	6.5	3.8	2.8	3.7	4.4	3.0	2.3	0.9
Developing countries	1.4	1.1	2.9	2.9	3.3	3.3	4.1	3.1	1.3	2.2
Brazil	0.6	-3.4	5.1	8.4	7.5	3.7	0.0	3.6	-4.0	-1.0
Republic of Korea	5.7	11.8	9.4	6.9	12.4	11.8	11.3	6.1	9.6	8.0
Countries of Eastern Europe c/	3.0	4.2	3.5	3.2	4.3	2.6	4.0	1.8	-6.3	-8.9
USSR	4.0	4.2	2.9	3.5	4.1	2.3	4.4	2.4	-4.0	...
China c/	7.2	7.1	7.9	12.3	7.4	9.4	11.0	4.0	4.4	6.0

Source: Trade and Development Report, UNCTAD, recent issues; Handbook of International Trade and Development Statistics, UNCTAD, recent issues; World Economic Survey, United Nations (New York), recent issues; World Economic Outlook, IMF, recent issues; Main Economic Indicators, OECD, recent issues; Economic Survey of Europe, 1990-1991, ECE.

a/ Rates refer to real gross domestic product or gross national product, unless otherwise specified.

b/ Not including East Germany. Figures for Germany prior to 3 October 1990 are indicated separately for the Federal Republic of Germany and the former German Democratic Republic.

c/ Net material product.

Annex II

Consumption of tungsten ores and concentrates, 1981-1991
(Metric tons of tungsten content)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991[a]
World	47,305	40,189	40,175	47,815	,45,297	,42,915	43,614	44,522	46,590	42,809	40,000
of which:											
Developed market-economy countries	,19,381	12,579	13,684	20,249	17,141	13,795	14,118	15,863	14,959	11,874	
Austria	1,850	1,304	1,629	2,096	(2,000)	(2,000)	(2,000)	(2,100)	(1,800)	(1,800)	
France	663	653	520	815	808	677	269	34	-	-	
Germany, Fed. Rep. of	1,348	1,541	2,030	3,934	2,073	1,720	1,863	2,144	2,576	749	
Japan	2,238	1,826	1,977	2,302	2,616	2,145	2,119	1,980	1,538	1,440	
Netherlands	(400)	(300)	(300)	(300)	(400)	(350)	(300)	(330)	(350)	(200)	
Sweden	1,432	994	774	765	820	855	567	550	(600)	320	
United Kingdom	879	660	560	610	(600)	(580)	(100)	(50)	(50)	(50)	
United States	9,839	4,506	5,181	8,577	6,838	4,804	5,506	7,832	7,725	(7,050)	(6,500)
Others	732	795	713	850	986	664	1,394	843	320	265	
Developing countries	2,897	2,698	2,318	2,872	3,453	2,956	3,196	2,559	2,931	2,635	
Brazil	480	454	450	538	1,048	672	867	753	(688)	(400)	
India	459	454	250	157	250	(230)	(250)	187	(200)	(200)	
Republic of Korea	1,898	1,742	1,555	2,070	2,048	1,987	1,950	1,580	2,000	(2000)	
Others	60	48	63	107	107	67	129	39	43	35	
Countries of Eastern Europe	(18,627)	(19,312)	(19,173)	(18,694)	(17,703)	18,364	17,800	(13,600)	(13,200)	(12,800)	
Socialist countries of Asia	(6,400)	(5,600)	(5,000)	(6,000)	(7,000)	(7,800)	(8,500)	(12,500)	(15,500)	(15,500)	

Source: UNCTAD secretariat, based on Quarterly Bulletin of Tungsten Statistics, Committee on Tungsten, various issues.

( ) Brackets denote estimates or apparent consumption.
a/ Provisional estimates.

Annex III

Consumption of concentrates and imported intermediate products in selected countries, 1985-1990[a/]
(Metric tons of tungsten content)

	1985	1986	1987	1988	1989	1990
Austria	2,295	2,237	2,447	3,402	3,569	4,112
France	1,193	995	1,387	1,694	1,917	955
Germany b/	3,046	2,505	2,558	3,723	4,465	2,665
Japan	3,716	3,305	3,987	4,654	5,162	4,782
Sweden	1,337	1,118	881	1,978	2,405	1,363
United Kingdom	781	650	c/	1,517	1,254	900
United States	8,794	6,774	7,179	9,766	9,087	8,248
Total (as above)	21,162	17,584	18,439	26,734	27,859	23,025

Source: Tungsten Statistics of the UNCTAD Committee on Tungsten.

a/ Some countries did not provide breakdowns of their imports of tungsten material until recently. In such cases, some of the data shown may have been underestimated.
b/ East Germany not included.
c/ Not estimated, owing to incomplete data.

Annex IV

Production of tungsten ores and concentrates, 1981-1991
(Metric tons of tungsten content)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991a/
World	50,514	48,079	42,849	50,591	49,244	46,267	40,992	45,580	48,463	43,830	40,000
of which:											
Developed market-economy countries	13,924	12,254	8,117	11,970	11,390	9,030	4,323	5,185	5,348	5,000	
Australia	3,333	2,588	2,061	1,733	1,970	1,572	1,152	1,261	(1,350)	1,086	
Austria	1,450	1,406	1,408	1,632	1,481	1,387	1,250	1,507	(1,500)	(1,500)	
Canada	2,052	2,938	328	3,715	3,005	1,273	-	-	-	-	
France	591	726	793	742	735	937	-	-	-	-	
Japan	631	804	474	477	568	570	259	266	286	254	
Portugal	1,396	1,359	1,182	1,509	1,766	1,657	1,209	1,381	1,376	1,404	
Spain	441	556	521	569	462	483	80	80	58	34	
Sweden	365	349	365	385	402	357	334	325	293	317	
United States	3,605	1,521	980	1,203	996	780	34	360	(450)	(400)	(600)
Others	60	7	5	5	5	5	5	5	35	5	
Developing countries	10,110	9,645	8,452	9,071	8,301	6,687	5,619	5,845	5,565	4,780	
Bolivia	2,778	2,534	2,490	1,893	1,643	1,160	624	924	1,118	(1,200)	
Brazil	1,248	1,365	1,026	1,101	1,297	875	672	739	(790)	(420)	
Korea, Republic of	2,742	2,539	2,101	2,702	2,370	2,240	2,180	1,825	1,560	1,250	
Mexico	158	78	147	145	282	294	213	206	170	183	
Myanmar, The Union of	825	844	930	1,096	945	715	493	450	464	450	
Peru	521	654	703	786	732	604	440	545	265	389	350
Thailand	1,210	856	563	742	585	512	702	651	648	290	
Viet Nam	-	-	-	-	-	-	-	(300)	(300)	(300)	
Other	628	775	492	606	447	287	295	205	250	298	
Countries of Eastern Europe	(9,280)	(9,480)	(9,780)	(10,050)	(10,050)	(9,050)	(9,050)	(7,050)	(7,050)	(7,050)	
Socialist countries of Asia		(17,200)	(16,700)	(16,500)	(19,500)	(19,500)	(21,500)	(22,000)	(30,500)	(27,000)	(22,000)

Source: UNCTAD secretariat, Quarterly Bulletin of Tungsten Statistics, Committee on Tungsten, various issues.
a/ Provisional estimates.
( ) Denotes estimates.

Annex V

Movements of tungsten stocks by type in selected countries, 1981-1990
(Metric tons of tungsten content)

	End of year									
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
A. Ores and concentrates										
Producers' stocks										
Australia	552	507	385	306	379	481	435	416	(800)	(900)
Bolivia	...	...	...	...	...	...	...	105	130	210
Brazil	–	–	17	17	17	875	...	70	(84)	(100)
France	43	139	159	76	85	205	65	–	–	–
India	7	21	11	32	54	50	50	57	10	11
Japan	173	211	32	39	27	26	21	41	72	75
Mexico	–	7	12	18	20	95	8	19	13	25
Peru	...	...	...	...	46	241	...	71	(54)	(70)
Portugal	301	380	370	251	305	1,042	941	969	1,057	1,180
Republic of Korea	267	338	76	231	200	44	45	(45)	–	–
Rwanda	29	30	40	48	...	(60)	10	10	10	22
Spain	...	...	75	114	84	50	62	47	45	20
Thailand	799	793	834	804	1,029	1,025	1,100	1,295	1,553	1,564
Turkey	116	23	116	96	80	145	43	20	–	–
United Kingdom	102	73	–	–	–	–	–	–	–	–
United States	108	54	54	46	60	21	21	21	(10)	(40)
Sub-total	2,497	2,576	2,181	2,078	2,386	4,360	2,801	3,186	3,838	4,217
Consumers' stocks										
Argentina	–	9	–	–	–	–	–	–	–	–
Canada	...	...	...	...	...	...	255	75	–	–
France	16	9	47	177	130	221	–	–	–	–
Japan	460	409	511	557	671	687	448	455	561	860
Portugal	24	3	5	3	10	1	–	1	1	1
Sweden	...	...	...	256	302	333	353	...	...	40
United States	672	1,765	1,085	959	1,077	502	329	499	1,261	1,077
Sub-total	1,172	2,195	1,648	1,952	2,190	1,744	1,385	1,030	1,823	1,978
Dealers' stocks										
Argentina	43	23	11	9	9	–	–	–	–	–
Japan	7	–	11	–	1	–	–	–	–	–
Peru	...	...	...	...	...	...	...	7	7	27
Thailand	379	530	462	339	113	116	120	51	107	83
Sub-total	429	553	484	348	123	116	120	58	114	110
Total (as shown above)	4,098	5,324	4,313	4,378	4,699	6,220	4,306	4,274	5,775	6,305
B. Ammonium paratungstate										
United States a/	1,649	748	870	1,191	1,056	477	292	911	915	896

Source: UNCTAD, Quarterly Bulletin of Tungsten Statistics, Committee on Tungsten, various issues and the Bureau of Mines, the United States Department of the Interior.

a/ Consumers' and Producers' stocks only.
– Denotes negligible or nil.
... Denotes not available.
( ) Provisional estimates.

Annex VI

DLA stockpile releases in relation to the total supply of tungsten concentrates in the United States, 1980-1991
(Metric tons of contained tungsten)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991a/
A. DLA stockpile release	958	344	259	1,368	902	301	708	524	466	-	-
B. Total supply of tungsten concentrates b/	9,754	5,142	4,135	8,219	6,312	4,144	5,314	8,864	7,584	7,050	...
C. DLA stockpile release as a proportion of total supply of tungsten concentrates (percentages)	10	7	6	17	14	7	13	6	4	-	-

Source: UNCTAD secretariat, based on data of the United States Bureau of Mines, the United States Department of the Interior.

- denotes negligible or nil; and ... denotes not available

a/ Estimates.

b/ Equal to the total of production, imports minus exports, stock movements and DLA releases.

Annex VII

An updated list of new tungsten mining projects

Location	Project	Company(ies)	Capacity in tons W	Completion date	Remarks
Australia	Burnie (Tasmania)	Taminex/McIntyre	-	-	Project awaiting decision
Bolivia	Chicote Grande	Anschutz Mining	1 000 a/	-	Project was due for completion in 1984-1985 but was halted.
Brazil	Carajas	Docegeo (CVRD subsidiary)	100	-	Development under consideration.
Canada (Northwest Territories)	Mactung	Amax	1 000-3 500	-	Originally commissioned for 1985 but postponed to 1987 and then further postponed; development awaiting market conditions to improve significantly.
France (Belfort)	Auxelles	Elf-Aquitaine/ Cominco	500	-	Deferred (originally due for completion in 1984).
India	Degana Rajasthan	Rajasthan Tungsten	200 b/	-	Project at proposal stage in 1988 but no further progress has since been reported; ore grade reported 0.3 per cent WO_3
	Almora	Uttar Pradesh Development Corp.	-	-	Reserves estimated at 10 m metric tons with an ore grade of 0.4 per cent tungsten content; a pilot plant reported to have been established in 1989 and commercial working could start within four to five years.
Mongolia	Caganova	Hungarian-owned Company	-	-	Little information is available other than the operation including both mining and dressing works: trial operations were reported begun on 10 Sept. 1988 at full capacity, the operation is expected to treat 36,000 metric tons of ore annually.
Peru	Altiplano	Minera Regina S.A.	680 b/	1988-1989	Expansion project (production of concentrates to increase to 2,700 metric tons per year); the completion date may have been extended.
South Africa (Cape Province)	Upington	Shell	600 a/	-	Completion date originally fixed for 1984 following a full-scale feasibility study after discovery of deposits in 1982; but the project has continued to be put in abeyance.
Spain (Salamanca)	Los Santos	Banco Bilbao/ Billiton BV	900 c/	-	High-grade deposits discovered in 1983 with reserves estimated at 1 m tons of ores grading 28 kg W per ton enough for 10 and 13 years' exploitation; developments awaiting improved market conditions.
(Almomarin)	La Parrilla	Banco Español de Credito y Banco Credito Industrial	1,500,000d/	-	Estimated resources 32 million metric tons containing 45,000 mt of WO_3; initial investment estimated at 1582 m pesetas to a maximum of 3082 m pesetas; opening under study.
Thailand	Doi Mek	Thai-Swedish Mining	340	-	Expansion (under consideration).
United Kingdom	Hemerdon (Devon)	Amax/Hemerdon Mining and Smelting	2 200	-	Planning permission was granted at the end of 1985) but development has been postponed.

Source: UNCTAD secretariat, based on annex VIII of TD/B/C.1/TUNGSTEN/84 as revised, and information provided by direct contacts and a number of periodicals, including Mining Magazine and Engineering and Mining Journal, recent issues.

Note: The information provided in the list may not be complete; Committee members are invited to provide additional information which may be available to them for updating or completing this table.

a/ Estimates by the UNCTAD secretariat. b/ Capacity refers to tons of ore per day. c/ Maximum estimate. d/ capacity refers to tons of ore per year.
- Denotes data not available.

Annex VIII

World exports and imports of tungsten ores and concentrates
1984-1990

(metric tons of tungsten content)

	1984	1985	1986	1987	1988	1989	1990
A. World Exports	26 496	27 092	23 892	22 957	24 210	25 811	17 293
Developed market-economy countries	8 264	7 893	4 833	3 137	3 758	2 953	2 545
Developing countries	7 020	6 747	5 394	6 415	4 098	4 644	4 476
Socialist countries of Asia	11 212	12 452	13 665	13 405	16 354	18 214	10 272
B. World Imports	26 931	25 134	21 399	20 439	21 664	22 128	17 983
Developed market-economy countries	15 820	12 753	8 637	9 494	13 697	13 206	10 004
Developing countries	1 467	3 228	2 948	1 651	1 393	2 922	2 179
Countries of Eastern Europe	9 644	9 153	9 814	9 294	6 574	6 000	5 800
C. Statistical balance (A-B)	-435	+1 958	+2 493	+2 518	+2 546	+3 683	-690

Source: UNCTAD secretariat, on the basis of Tungsten Statistics of the Committee on Tungsten.